

## NUTRIENT MANAGEMENT PLAN

May 24, 2000

Tysons Research Farm

Manager: David Dickey

## FARM DESCRIPTION

The main research facility is located approximately 1 mile North of the Tysons Corporate Headquarters on Johnson Road. There are two houses on site; one 16'x500' and one 16'x250'. The houses are approximately 50 years old. The pasture land consists of about 150 acres in 15 fields within a 1-mile radius of the research facility. Forage is primarily Fescue. 238 head of beef cattle are presently run on the property.

As this is a research facility, cycle length and grow-out weights of the birds will vary with different research trials. Location and farm and field boundaries are shown on the attached maps.

## SOILS

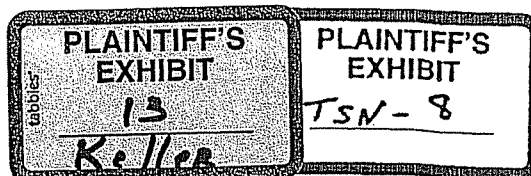
The major soil types are as follows:

Soil Type	Runoff Potential	Leaching Potential
ClG	Severe	High
Eg	Severe	High
NaC	Moderate	Low
NaD	Moderate	Low
Rg	Moderate	High
CaC	Moderate	Moderate
Sn	Moderate	High

Soils with a high leaching potential are considered critical soils because they are potentially a source of rapid recharge of ground water. Soils with a severe runoff potential could be a hazard to surface water because of soil erosion.

## RECOMMENDATIONS

To prevent the contamination of surface water or groundwater, we recommended that buffer zones be maintained when applying animal waste as fertilizer. Recommended buffer zones are shown on the attached buffer maps.



TSN18687SOK

We also recommended that no litter be applied in the following situations:

1. Soils with less than 10 inches to bedrock.
2. Areas within 100 feet of a well, sinkhole, pond, or stream.
3. Areas with a slope of greater than 15%.
4. Soils that are frequently flooded.
5. Areas within 50 feet of property boundaries.
6. On snow covered fields.
7. Immediately prior to, during, or following heavy rainfall.
8. Outside the normal growing season of the forage.

Litter application rates (See Table I, below) should be based on soil test results provided by the Cooperative Extension Service. Broiler litter should not be applied on fields with soil test phosphorus levels above 300 lbs/acre. For fields with high phosphorus levels, apply commercial nitrogen and potassium fertilizer to individual fields according to soil test recommendations.

**NUTRIENT VALUES of BROILER LITTER**  
(Determined by U of A Agricultural Diagnostic Lab)

Nutrient Content of Broiler Litter ("As Is" Basis) lb/ton	
West Spike	
N-P-K 51-26-40	N-P2O5-K2O 51-59-48
East Spike	
N-P-K 29-16-24	N-P2O5-K2O 29-37-29

Table I. Litter Application Recommendations for Cool and Warm Season Grasses.

Lbs of Soil Test P	Medium Production Cool-Season	High Production Cool-Season	Medium Production Warm-Season	High Production Warm-Season
>300	0	0	0	0
251-300	0	1	1	1
201-250	1	1	2	2
151-200	2	2	3	3
101-150	2	3	3	4
51-100	2	3	4	5
0-50	3	4	5	6

Cool and Warm Season refer to cool season grasses such as fescue and warm season grasses such as bermudagrass.

Field numbers, soil phosphorous levels, and recommended litter application rates are listed below. Soil analyses indicate phosphorous levels are greater than 300 pounds per acre in fields 1,2,4,5,6,8,10 and 11. We recommend that no broiler litter be applied on these fields. We recommend that the bulk of the litter be sold, stored or applied to fields not included in this plan. In the future, apply litter based on current soil tests when soil P levels drop below 300 lbs/ac.

Soil Test Phosphorous Levels and Recommended Fertilizer Applications

Field # (acres)	Forage	Soil Test P lb/ac	Recommended litter application tons/ac	Split Application yes/no
1 (3 ac)	Fescue	717*	0	NO
2 (3.5 ac)	Fescue	462*	0	NO
3 (10 ac)	Fescue	279	1	NO
4 (36 ac)	Fescue	321*	0	NO
5 (5 ac)	Fescue	726*	0	NO
6 (4 ac)	Fescue	506*	0	NO
7 (25 ac)	Fescue	171	2	NO
8 (25 ac)	Fescue	320*	0	NO
9 (65 ac)	Fescue	140	2	NO
10 (5 ac)	Fescue	386*	0	NO
11 (28 ac)	Fescue	338*	0	NO
12 (20 ac)	Fescue	179	2	NO
13 (23 ac)	Fescue	229	1	NO

Several of the fields on this farm have soils with a severe runoff potential or high leaching potential. For these fields and those planted in high production vegetation, litter or commercial fertilizer applications should be split and applied in two applications rather than one. Split applications of fertilizer should not contain more than 50% of the yearly crop nitrogen need.

Litter production for these reports is normally estimated using NRCS handbook Engineering-Agricultural Waste Management Field Handbook, Ch.4. In this particular case, cycle lengths and number of cycles will vary, therefore an accurate estimate of litter production is not feasible. We recommend that records be kept of the number of loads of material removed from each house in order to approximate yearly production.

#### GRAZING PLAN

The 238 head of beef cattle currently on this farm will require at least 1314 tons of forage per year. The farm is estimated to produce 605 tons of forage per year resulting in a deficit of approximately 709 tons per year: in other words, the farm will be approximately 197 days short of supplying forage for the current stocking rate. These estimates are likely underestimated since the rotational grazing system in place on this farm greatly enhances your forage utilization.

#### Minimal Residual Grazing Heights and Recovery Periods:

See Table 1 of the Prescribed Grazing Standard (528A in FOTG) for minimum residual heights for existing and planned forages (see insert in plan folder). Approximate recovery periods should also be listed for rotational grazing systems.

<u>FORAGE</u>	<u>MIN. AVG. HT.</u>	<u>RECOVERY PERIOD</u>
Fescue	3 in.	21-30 days
Large White Clover	3 in.	18-25 days
Hybrid Bermudagrass	3 in.	18-28 days

#### Strategies to Maintain Minimum Residual Heights:

- ☒ 1. Match class of livestock and stocking density with seasonal forage availability. Modify animal type or numbers or establish alternate forages when necessary.
- ☒ 2. Extend grazing season with additional warm or cool-season annual and perennial grasses and legumes.
- ☒ 3. Subdivide pastures to allow adequate forage recovery periods. Utilize shorter rest periods during rapid growth phases, and use longer rest periods when plant growth slows. Keep records of grazing and resting periods on optional form.
- ☒ 4. Maximize nutrient recycling by rotating cattle and distributing water, shade and minerals throughout the pastures.
- ☒ 5. Lime and fertilize pastures according to soils tests.
- ☒ 6. Control competing undesirable vegetation with grazing or browsing animals, spraying chemicals according to label instructions, mowing or bush-hogging or a combination of all these methods.
- ☒ 7. Stockpile forages for winter feed.
- ☒ 8. Avoid drought stress by maintaining healthy, vigorous forages.
- ☒ 9. Provide sacrifice areas where livestock can be concentrated and fed during prolonged dry or wet periods to protect the remaining pastures.
- ☒ 10. During extended droughts, cull animals when necessary to maintain forage resources.

# NONTECHNICAL SOILS DESCRIPTION REPORT Soils

Map  
Symbol

Soil name and description

ClG

Clarksville cherty silt loam, 12 to 60 percent slopes

These soils are severely limited for pasture and are unsuited for cultivated crops. Slope and surface stones severely restrict the use of farm equipment. Where pasture is established, plants include tall fescue and native grasses. Some areas can be used for native grass pasture if brush is controlled; however, controlled grazing and fire protection are needed to maintain soil cover and prevent excessive erosion.

These soils have a severe surface runoff potential and a high leaching index. Nutrient movement to surface and ground waters is a hazard on these soils. A system of intense nutrient management practices that reduces runoff and erosion and minimizes the movement of soluble nutrients below the root zone should be planned on these soils. Soluble forms of nutrients should be applied with extreme caution or avoided if other forms of nutrients are available.

Eg

Elsah gravelly soils (ceda)

This soil is poorly suited for cultivated crops and moderately suited for pasture. Flooding is a moderate hazard during the winter and spring. Droughtiness is also a moderate limitation due to high content of coarse fragments. Adapted pasture plants include common and improved bermudagrass and tall fescue.

These soils have a severe surface runoff potential, due to common flooding, and a high leaching index. Nutrient movement to surface and ground waters is a hazard on these soils. Nutrient management practices that minimize the movement of soluble nutrients below the root zone and exclude the application of nutrients during periods when flood risk is high should be planned on these soils. Soluble forms of nutrients should be avoided if other forms of nutrients are available.

NaC

Nixa cherty silt loam, 3 to 8 percent slopes

NONTCHNI L SOILS DESCRIPTION REPORT  
Soils

Map Symbol	Soil name and description
	<p>These soils are moderately suited for pasture and poorly suited for cultivated crops. Slope and high content of chert fragments on the surface are the main restrictions. Erosion is also a severe hazard in areas without adequate cover. Suitable pasture plants include tall fescue, common and improved bermudagrass, and native grasses. Good management practices include controlled grazing and proper stocking. Conservation practices need to be intensified as slope length and gradient increase.</p> <p>These soils have an moderate surface runoff potential and a low leaching index. Nutrient movement to surface waters could be a hazard on these soils. In addition to management practices such as soil tests and proper application rates, a system of practices that reduces runoff and erosion should be planned on these soils.</p>
NaD	<p>Nixa cherty silt loam, 8 to 12 percent slopes</p> <p>These soils are moderately suited for pasture and poorly suited for cultivated crops. Slope and high content of chert fragments on the surface are the main restrictions. Erosion is also a severe hazard in areas without adequate cover. Suitable pasture plants include tall fescue, common and improved bermudagrass, and native grasses. Good management practices include controlled grazing and proper stocking. Conservation practices need to be intensified as slope length and gradient increase.</p> <p>These soils have an moderate surface runoff potential and a low leaching index. Nutrient movement to surface waters could be a hazard on these soils. In addition to management practices such as soil tests and proper application rates, a system of practices that reduces runoff and erosion should be planned on these soils.</p>
Rg	<p>Razort gravelly silt loam, occasionally flooded</p>



NONTECHNICAL SOILS DESCRIPTION REPORT  
Soils

Map  
Symbol

Soil name and description

This soil is well suited to pasture and hayland, and cultivated crops. Occasional flooding during the late fall, winter, and early spring is a moderate hazard. Suitable crops include corn, soybeans, grain sorghum, and truck crops. Adapted pasture plants include bermudagrass, bahiagrass, tall fescue and white clover.

These soils have a moderate surface runoff potential, due to occasional flooding, and a high leaching index. Nutrient movement to surface and ground waters is a hazard on these soils. Nutrient management practices that minimize the movement of soluble nutrients below the root zone and exclude the application of nutrients during periods when flood risk is high should be planned on these soils. Soluble forms of nutrients should be avoided if other forms of nutrients are available.

CaC

Captina silt loam, 3 to 6 percent slopes

These soils are moderately suited for cultivated crops, and well suited for pasture and hayland. Runoff is medium to rapid and erosion is a severe hazard if cultivated crops are grown. Practices which help reduce runoff and control erosion are recommended. Adapted pasture plants include common bermudagrass, improved bermudagrass, and tall fescue. There are no significant limitations for pasture.

These soils have an moderate surface runoff potential and a moderate leaching index. Nutrient movement to surface and ground waters could be a hazard on these soils. In addition to management practices such as soil tests, proper application rates and split applications of soluble forms of nutrients, a system of practices that reduces runoff and erosion and minimizes the movement of soluble nutrients below the root zone should be planned on these soils.

Sn

Sloan silt loam



NONTECHNICAL SOILS DESCRIPTION REPORT  
SoilsMap  
Symbol

## Soil name and description

This soil is moderately suited to cultivated crops, and pasture and hayland. Wetness commonly delays farming operations several days after a rain and surface drains are needed. Wetness may also limit grazing during the winter and early spring on areas which are in pasture. Suitable crops include soybeans and grain sorghum. Winter small grains may also be grown on areas with adequate surface drainage. Adapted pasure plants include bermudagrass and tall fescue.

These soils have a moderate surface runoff potential, due to occasional flooding, and a high leaching index. Nutrient movement to surface and ground waters is a hazard on these soils. Nutrient management practices that minimize the movement of soluble nutrients below the root zone and exclude the application of nutrients during periods when flood risk is high should be planned on these soils. Soluble forms of nutrients should be avoided if other forms of nutrients are available.

TSN18695S0K

Tyson Research Farm

CLIENT: Tysons

COUNTY: Washington

APPROX. ACRES: 230

ASSISTED BY: Orion Russell

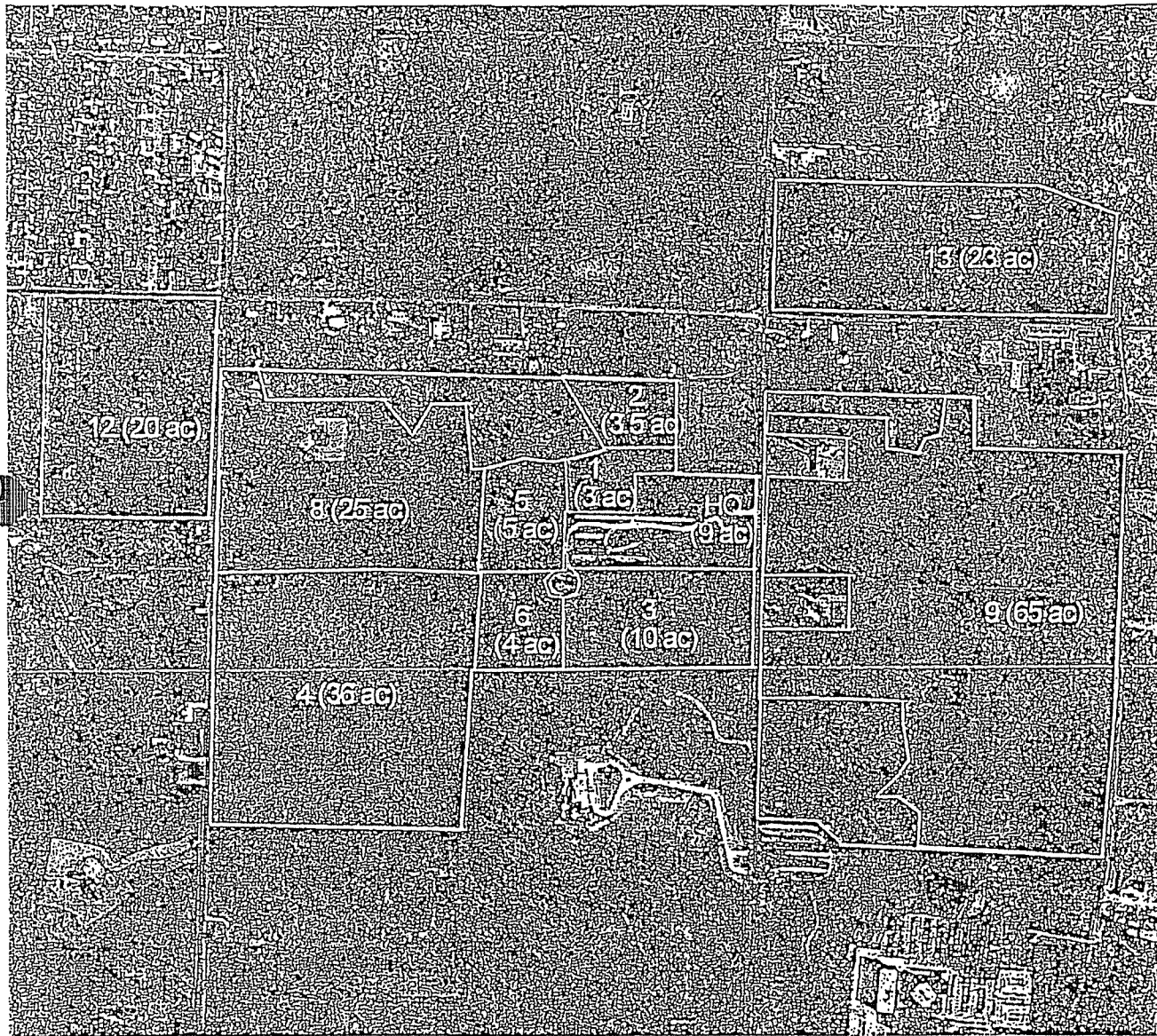
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STATE: AR

SCALE: 1: 10,000

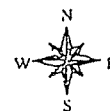
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COOPERATING WITH: WASHINGTON COUNTY CONSERVATION DISTRICT



U.S. DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE



TSN18696S0K



Tysons Research Farm Buffers

CLIENT: Tysons, Inc.

COUNTY: Washington

APPROX. ACRES: 250

ASSISTED BY: Orion Russell

OPERATOR: David Dickey

STATE: AR

SCALE: 1: 7920

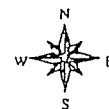
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COOPERATING WITH: WASHINGTON COUNTY CONSERVATION DISTRICT



U.S. DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE



TSN18697SOK

Tysons Research Farm

CLIENT: Tysons, Inc.

COUNTY: Washington

APPROX. ACRES: 230

ASSISTED BY: Orion Russell

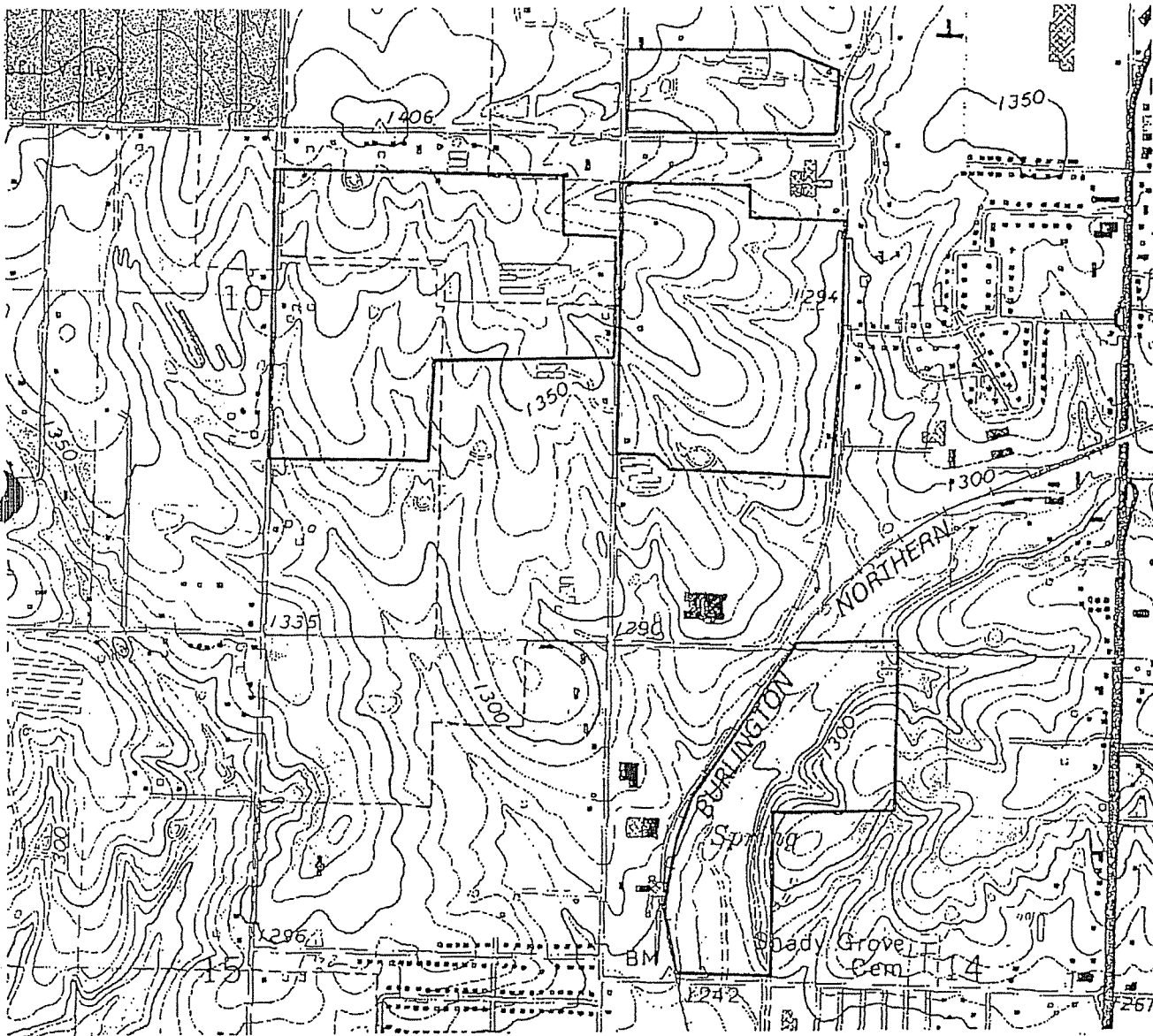
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STATE: AR

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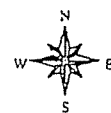
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COOPERATING WITH: WASHINGTON COUNTY CONSERVATION DISTRICT



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TSN18698S0K



Tyson Research Farm

CLIENT: Tysons, Inc.

COUNTY: Washington

APPROX. ACRES: 230

ASSISTED BY: Orion Russell

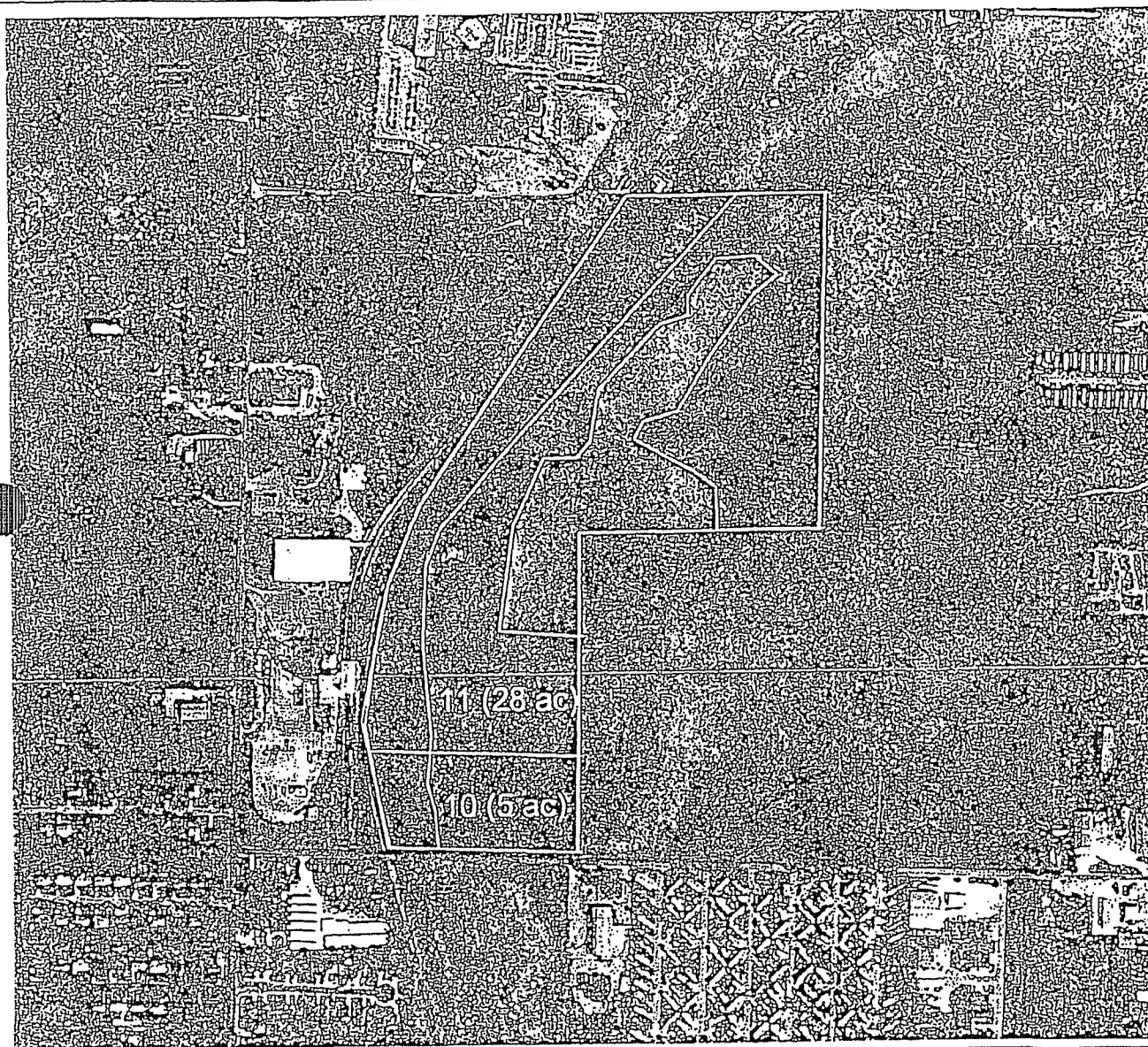
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STATE: AR

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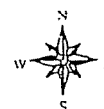
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APPROX. ACRES: 230

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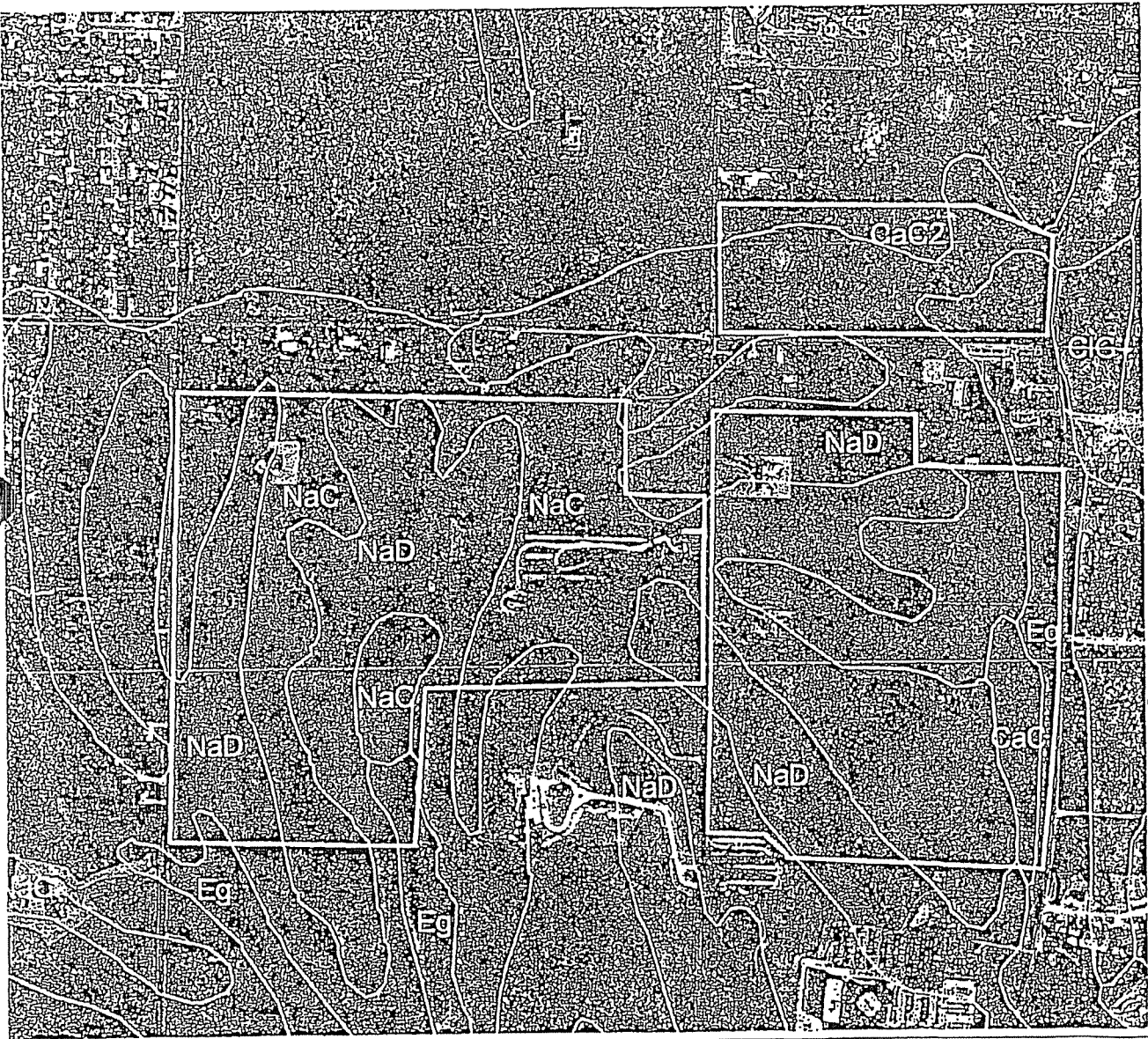
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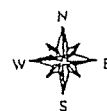
PHOTO ID: 94

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